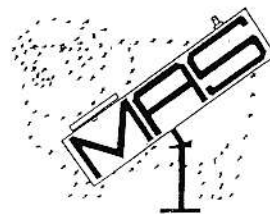


MACARTHUR ASTRONOMICAL SOCIETY



MAS Newsletter

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MAY 1996

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PRESIDENT'S REPORT

Once again a warm welcome to all our members. First, let me thank all those members who participated in our Bringelly Star Night. We are still a little disorganised with these events but with patience and experience we will learn and improve as more of these nights unfold throughout the year.

Many thanks go to our members who brought along 'scopes. especially Eric and Noel. I apologise if anyone was forgotten. We need more telescopes. All you members dying to try out your new telescopes, or resurrect an old one, please come along. We can see more objects if we have more 'scopes.

A special mention and thanks to Robbie, our hard working Treasurer, for having us at his property.

OUR NEXT STAR NIGHT - JUNE.

Our next Star Night is going to be held on Saturday 15th June, at Bargo in conjunction with the Sutherland Astronomical Society. Please ring me (Phil Ainsworth) for details of how to get there, after the 6th June.

During the Star Night, every member will have a star map of the relevant sightings for that night, from around 8pm.

This is a great opportunity to rub shoulders with a large number of amateurs who started like us and have gained experience which we are slowly starting to

pick up. Here is a chance to see OUR Society's future and be inspired.

So, let's see as many people there as possible. And bring a warm coat, beanie and a thermos.

Where to go? It's at the old airstrip at Bargo on Yarren Lane.

As you approach Bargo, turn right at the Tee-junction, go 3 to 4 km, go through Bargo, over a bridge, turn right at the next tee-junction and that's Yarren Lane.

OUR SPEAKERS

Thank you, Don Neely, for a very entertaining and informative talk about detecting planets around other stars. Your practical demonstration of the Doppler effect was most instructive.

Our speaker for May (tonight) is Phillip Young who will be talking about Interstellar Travel. And...

17th June - Morris Jones will speak on Mars. (Actually, he will speak here, on Earth, but he'll talk about Mars.)

I have heard both Phillip and Morris lecture before and have found them both extremely interesting.

15th July - (get that! the 15th). Bob Bee will talk about measuring the distances to the stars and beyond.

19th August - Possibly Peter Drury - to be confirmed. (Has anyone asked Peter?)

(Phil Ainsworth)

LATEST NEWS FROM JUPITER.

Scientists have been studying the Galilean probe data and found the winds inside the Jovian atmosphere are higher in velocity than previously measured. Originally, they were recorded at 500km/hr but now have been estimated nearer to 650km/hr. The high winds are believed to be due to an internal heat source, not solar winds as previously thought.

Lightning was much less than expected, also water and other elements. However, the storms on Jupiter are still much fiercer than on Earth. (That's an understatement - Ed.)

SATURN.

The Cassini space probe which will be launched in October, 97, bound for the ringed planet, will contain not only scientific equipment but a CD containing one million signatures from people around the globe.

You could be one of them by writing your signature on a postcard and sending it with a \$1.05 stamp to the United States. Let me know if you are interested.

PLUTO.

Features of Pluto's surface have been observed through the Hubble Space Telescope. HST viewed the planet throughout Pluto's 'day' (6.4 Earth Days). The images reveal many albedo features including a polar cap (North) and many bright and dark markings.

COMETS.

Comet Hyakutake has returned to our skies. It is visible in the morning twilight's Eastern sky (around 6am) as a bright object with a well defined tail. Despite the Moon's glow, binoculars should still give a good view of the comet. From May 20th to Mid-June, it can be found in the constellation of Eridanus.

Comet Hale-Bopp is also coming into view, though not currently visible to the naked eye. At present, it's a fuzzy spot of about eighth magnitude (about the same magnitude as the red supergiant in the Jewel Box cluster near Beta Crux). It should be visible about 11pm in Sagittarius in Jupiter's present vicinity. Try and pick a night when the Moon is not too bright. But be patient - it is going to get a lot closer and, we hope, a lot brighter. (Phil Ainsworth - President)

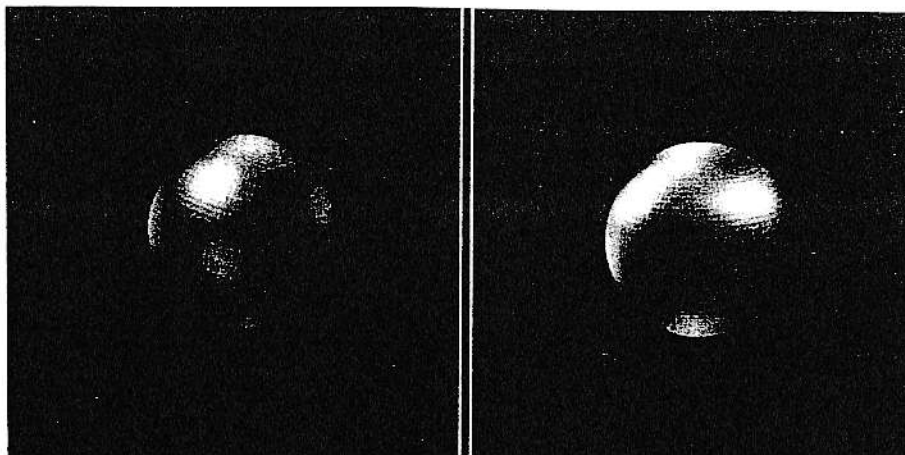
LIBRARIAN'S REPORT

It's good to see the material being used. Next month, time permitting, I will have some videos for loan.

One important point: Items are for a borrowing period of one month. Please return them as near to the next meeting as possible. I will have 'date due' stamps and slips on each item. (P.A. - Librarian)

MEETING NIGHTS

Members are reminded that MAS meeting nights are on the 3rd Monday of each month. Please be wary of the dreaded "15th of ..." which falls on a Monday night. It's easy to forget it is the 3rd Monday.



Images of Pluto from
Hubble Space Telescope

"THE EAGLE HAS LANDED"

Having landed safely at Tranquillity Base, we conducted our experiments and took one small step for Man and one giant leap for Mankind!

Or as Maxwell Smart Agent 86 would say, "would you believe" some binoculars in Robbie's backyard at Bringelly.

So begins the Macarthur Astronomical Society's Lunar Observation Night.

I was pleasantly surprised by the turnout with many members of the general public present, adults and children alike. Eric's 200mm (8") Meade promptly set its sights upon the now setting constellation of Orion, the 115mm (4.5") TASCO followed suit and the Great Orion Nebula created much interest amongst the spectators.

What also created much interest was Betelgeuse, Beatlejuice, Beltageese - not the red supergiant itself but how to pronounce its b**** name.

After Orion bid us farewell i.e. "it set", we focussed our sights upon "the Big Cheese", an object so big that unlike Comet Hyakutake, you would have to be Ray Charles to miss it.

As people gathered around the scopes, it was a real pleasure to hear words like "wow", "fantastic" and "Mavis, you'd better come look at this".

What provided such fascination was, of course, the Moon. Through telescopes we can define its mountain ranges, valleys, shadows and thousands of craters. For those who have never seen these sights, it provides a splendid view indeed.

After that, "the game was afoot" with viewings of Alpha Centauri, the Jewel Box and Omega Centauri clusters. The viewings were enhanced by favourable weather, clear, bright and with little or no wind present.

There was some embarrassment when someone commented "what's that pale patch of light up there" just under the False Cross. First I thought it was some new

religious order. However, upon further analysis (ie a telescope was aimed at it) this object turned out to be a beautiful star cluster. The question was then posed "what is it?". A very amateur astronomer who will remain nameless was heard to say "Gee, buggered if I know" to the crowd present. It certainly drew a few laughs, but sadly at the expense of credibility.

A consultation with a higher authority was needed, ie Eric. This resulted in a search of the star maps in order to resolve this puzzle (no pun intended).

After that, Mr Sandman paid us a visit and the crowd dwindled to the diehards. A bit of a shame really, but understandable due to the nature of the hour. But, as they say, things come to those who wait and the wait was really worth it.

Jupiter, the largest planet in our solar system, rose majestically around 11pm. Several viewers had not seen Jupiter through telescopes so a strategy was implemented.

The TASCO, with a smaller aperture than the Meade, was loaded with magnification and could resolve Jupiter's bands. However, tracking required constant attention by the operator.

The Meade, with lower magnification, showed the entire Jupiter system, a splendid sight with the planet, its moons always in view courtesy of the Meade's electronic motor drive.

So drew to a close the second M.A.S. field night, and a great night it was indeed.

A big 'thank you' to Robbie Charlton for the use of his property at Bringelly. Also to Eric Brown for his excellent array of scopes. And lastly, thanks to the dog that drank my coffee while I left it on the ground - only for a second while I was packing up.

Noel Sharpe.



'MY, WHAT A BIG TELESCOPE YOU HAVE.'

Just as you thought you had the biggest...

The magnificent Keck twins (Keck I and Keck II) on Mauna Kea, Hawaii, are about to be outdone. At least size-wise.

The Keck instruments, perched on the dead volcano at a breathless (literally, with only 60% of sea level oxygen) height of 4,200 metres, are each a staggering 10 metres diameter (compared to Siding Spring AAT with 4m dia). But the boggling bit just begins.

Each 10m diameter mirror is in fact made up of 36 separate hexagonal 1.8m diameter mirrors. These fit together to form the 10m mirror. Each 1.8m segment had to be made to the exact asymmetric shape to achieve the perfect parabolic shape of the 10m mirror.

But there's more.

Because of the affects of gravity and the relative movement between the segments (with movement of the telescope) each segment is bedded on and controlled by an ingenious array of sensors and actuators that keep the segment in position relative to its neighbours to an accuracy of 4 nano-metres - ie 1/1000th the thickness of a human hair. This adjustment occurs every half second.

There are two identical 10m telescopes (called Keck I and Keck II), each housed in its own 37 m diameter dome which are about 110m apart on a common underground

control and support complex. Each telescope has a light collecting area of 76 sq.m which is 17 times that of the Hubble ST.

The Hubble ST can see more clearly (being out in space) but the Kecks can see further and gather scientific data that is beyond the reach of any other existing telescope. Add to that the resolution power, through optical interferometry, of the two 10m telescopes. The largest pair of binoculars in the world!

Using both 10m mirrors and linking their light paths, Keck's astronomers have the ability to resolve stellar objects as though they had a single mirror 85 m in diameter.

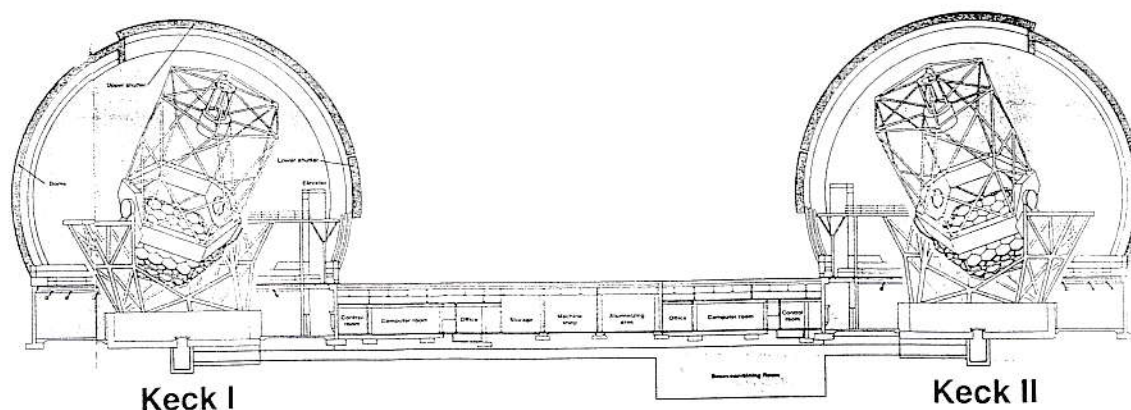
Here's looking at you!

But just as you think you're the biggest...

The new World's Largest Telescope is on its way. Called the Very Large Telescope (VLT), this telescope of the European Southern Observatory (ESO, a European organisation for astronomy) is to be built on La Paranal Mountain in the Atacama Desert in Chile. (Check your atlas.)

The VLT will comprise four (that's right - four) separate 8.2m diameter telescopes, giving a total light collecting area of 211 sq.metres, compared to the 157 sq.metres of the combined Keck I + Keck II.

The first mirror and dome (now called an 'enclosure') is scheduled to be fully erected this month (May 1996). First receipt of light is scheduled to be at the end of 1997.



A schematic layout of the two Keck telescopes.

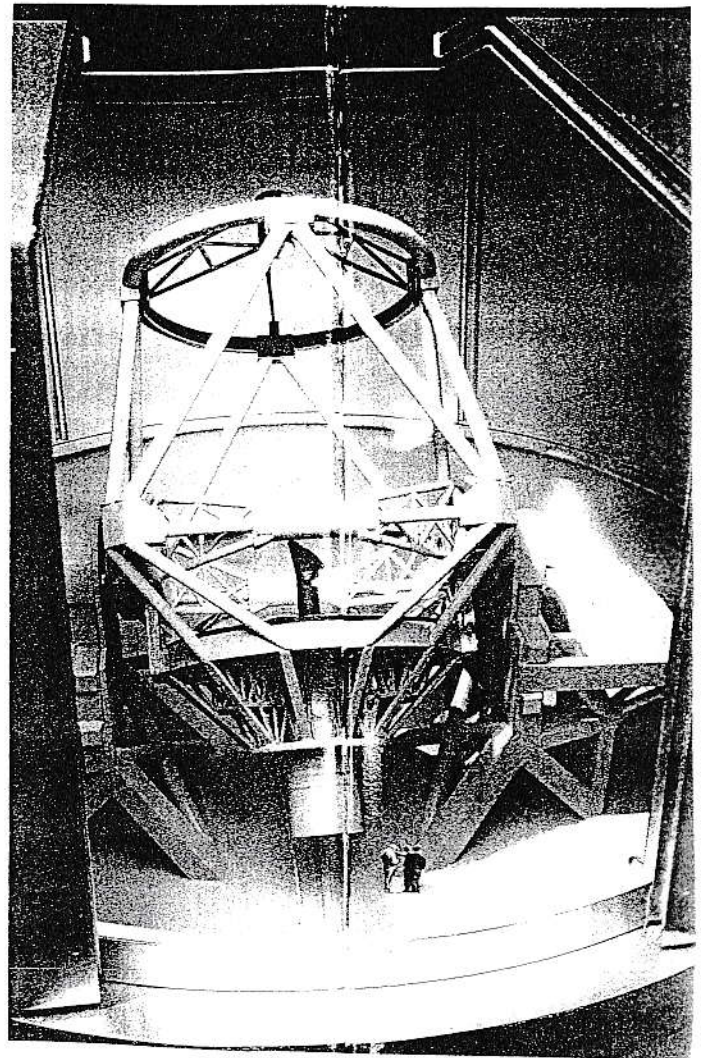
Australian astronomers were hopeful of joining ESO to allow them to participate in the use of this magnificent instrument - the largest in the Southern Hemisphere AND the world. Unfortunately political pork-barrelling in the last Federal election resulted in the recommended contribution to the ESO being reallocated to other science projects. (See letter to Herald below.)

However, it seems the new government is 'reviewing the situation' and it is hopeful that Australia may still have a role to play in this exciting new telescope.

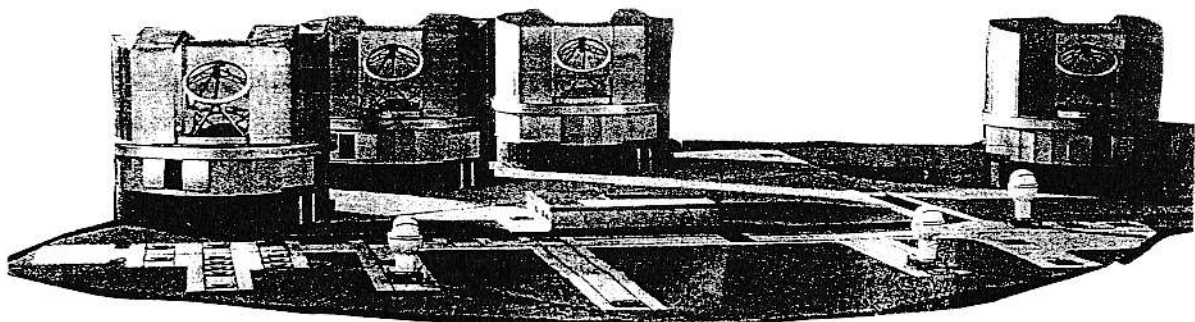
And what will VLT be capable of? Using the optical interferometry of the multiple mirrors, in conjunction with three movable 1.8 m telescopes, the VLT will achieve a staggering optical resolution of 0.0005 arc-seconds. (An arc-second is 1/3600th of a degree). The best current single mirror earth-bound telescopes can achieve 0.2 arc-seconds and the Hubble ST approx 0.01 arc-seconds. Therefore the VLT has a resolution 20 times better than the Hubble ST. It should be able to see a 2 metre wide object on the Moon.

So, what's next. An Extra Large Telescope of six 10 metre mirrors on top of a mountain in Antarctica? Sounds good. Or an Ultra Large Telescope of ten 8.2 metre mirrors on the Moon? Sounds even better.

(R Bee)



An Artist's impression of the Very Large Telescope. Note the four enclosures for the 8.2m telescopes and the three moveable 1.8m telescopes.
(Courtesy of ESO)



OUR LIBRARY REFERENCE

Yes, I've seen it with my own eyes. Our MAS Newsletter is catalogued in Campbelltown Library under "520.5 Mac Periodical" and is located in its own Periodical box in the Local Research room right at the back of the Reference Area. We've come a long way in a short time.

All the more reason to sit down at your typewriter and draft an item for either the Newsletter of the Journal.

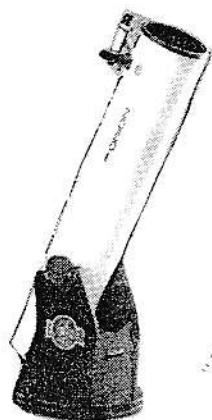
(Bob Bee)

THE JOURNAL.

CONTRIBUTIONS TO THE SOCIETY'S FIRST JOURNAL ARE STILL EAGERLY AWAITED. I KNOW SOME OF OUR MEMBERS ARE PREPARING ARTICLES BUT I'M SURE MORE OF YOU HAVE SOMETHING TO CONTRIBUTE. PLEASE DISCUSS ANY IDEAS FOR AN ARTICLE (SHORT OR LONG) YOU MAY HAVE WITH ME.

WE WANT TO MAKE OUR FIRST JOURNAL A 'WINNER'.

(BOB BEE - EDITOR)



*"The amateurs' telescope:
A Dobson mounted Newtonian."*

BLACK HOLES.

A massive black hole has been detected in an active galaxy by Hubble Space Telescope (HST). The galaxy is NGC4261. A mysterious spiral shaped disc of dust, also detected by Hubble ST, was thought to be fuelling the black hole.

This comes on top of the previous seemingly conclusive evidence (also by courtesy of HST) of a massive black hole in the centre of the giant elliptical galaxy NGC 4486 (also known affectionately as Messier 87) which is about 50 million light years away in the constellation of Virgo.

Astronomers estimate, from the measured velocities of the whirling discs of hot gases around the suspected black hole, that the black hole has a mass of three billion of our Suns, but it is packed into a volume no larger than our solar system.

These discoveries add weight (Ha Ha!) to the proposition that black holes are a lot more common than some would think (or like to think).

In fact, there are a number of likely black holes in our galaxy, the Milky way, under intensive investigation. One, V404 Cygni, is estimated to have a mass greater than six of our Suns.

Naturally, astronomers cannot see the actual black hole, but they can detect it by its influence on adjacent matter and by characteristic emissions of different forms of radiation as the doomed matter falls into the gravity well (ie black hole). (Bob Bee)

MAS EXECUTIVE COMMITTEE

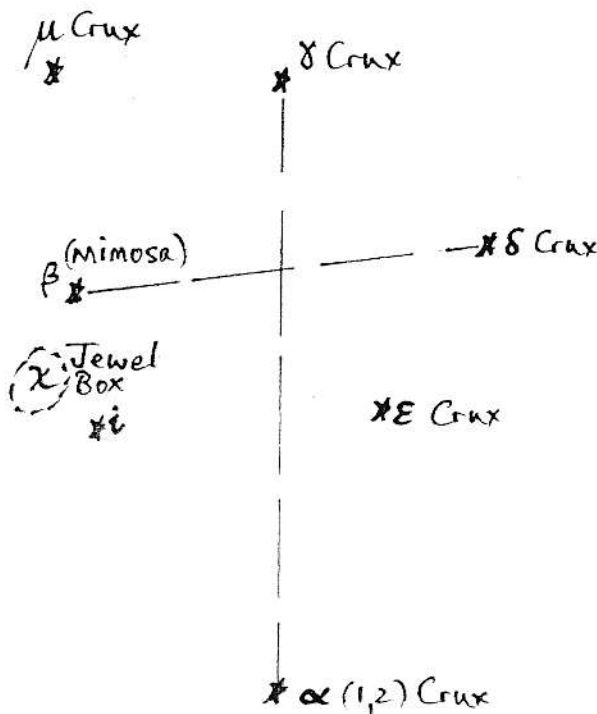
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MAY STAR GAZING THE SOUTHERN CROSS

At this time of the year, Orion is getting much lower in the sky, so it's a good time to start exploring other constellations.

The Southern Cross (and Centaurus) are very high from March through to August and in May, times up to midnight find them almost directly overhead. Let's not make the mistake of taking the Southern Cross for granted - it's a great subject for study. It gives choice views for both binoculars and small telescopes.

The following refer to the sketch below:



α (Alpha) Crux is 510 l.y. away. To the naked eye it is a bright star of 0.8 mag. but binocs or a small scope reveal it to be a double star with blue-white components.

β (Beta) Crux, also called Mimosa, is a 1.2 mag. blue-white giant 490 l.y. away. An example of a Cepheid Variable which fluctuates in magnitude by 0.1 mag every 6 hours.

γ (Gamma) Crux is 105 l.y. away and 1.6 mag. A red super giant. It has a faint unrelated visible companion of 6.5 mag which binoculars can pick up.

δ (Delta) Crux. At 2.8 mag and 490 l.y. away, it is the faintest of the four "Cross" stars. A blue-white star.

ε (Epsilon) Crux, the "in-between" star, is 3.6 mag and 160 l.y. away. An orange giant.

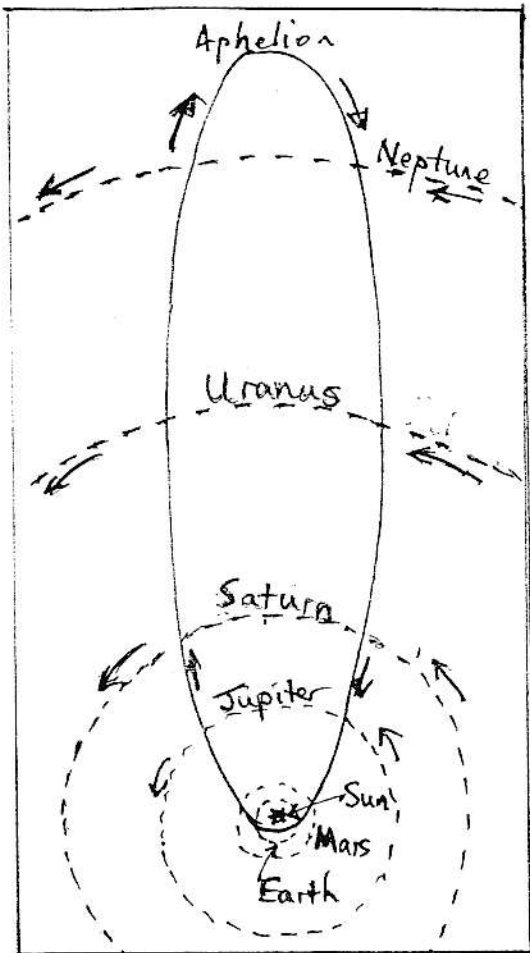
ι (Iota) Crux. A yellow giant 240 l.y. away. It is 4.7 mag and has a faint 9.5 mag companion which small telescopes can resolve.

μ (Mu) Crux. Small telescopes or good binoculars can see this well separated pair of blue-white giants. They are 4.0 mag (680 l.y.) and 5.7 mag (550 l.y.) respectively.

The Jewel Box, or κ (Kappa) Crux Cluster, or NGC4755 is a one of the most beautiful star clusters. A 4.0 mag star seen by the naked eye turns into an 'A' shaped cluster of a least 50 stars of various colours. A red supergiant (8.0 mag) is surrounded by mostly blue supergiants of 6.0 and 7.0 magnitudes. The name 'Jewel Box', given for obvious reasons, is courtesy of John Herschel. The jewels are safely out of reach at 7,600 l.y.

Centaurus can wait for another Newsletter. Why not go outside on a clear night and try to identify each of the above stars. It's a lot more fun when you know what to look for and what you're looking at.

(Bob Bee)



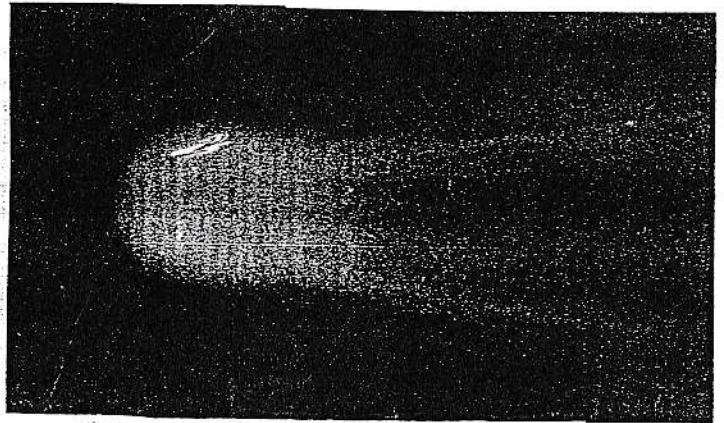
Halley's Comet Orbit.
Perihelion 1910, 1986.

COMETS

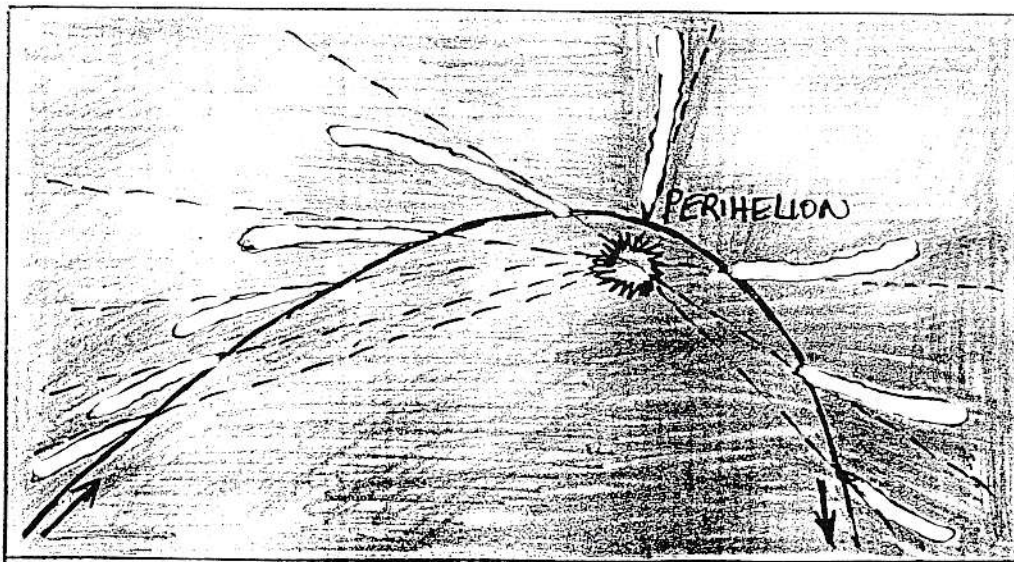
Of all the heavenly bodies visible to the unaided eye, comets are the most remarkable. Their frequent sudden and unheralded appearances in the sky, the abnormal paths they pursue across the celestial sphere, and the spectacular display that a large comet can produce, make them altogether unique in the world of astronomy.

The layman may not know much about stars and galaxies, but he knows about comets. After all, there was Halley's...

Beautiful as they may be, comets still obey the laws of physics as they move from the Oort Cloud on their thrilling passage past the Sun.



Halley's Comet, 1910.



A comet's tail always points away from the Sun.